

Chesapeake & Ohio Canal
Dam No. 2 & Associated Structures
Historic Structure Report

By Harlan D. Unrau

Historical Data
May 1976
C & O Canal National Historical Park
Md.-D.C.-W.Va

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Preface to the Original Edition

This report has been prepared to satisfy in part the research needs for the preservation and stabilization of Dam No. 2 and its associated structures. The purpose of this report has been to provide a thorough historical study of the Dam No. 2 complex to insure that the stabilization and preservation of these structures are historically accurate.

A number of persons have assisted in the preparation of this report. Thanks are due to Interpretive Specialist Ellwood Wineholt for assistance at the park headquarters; to Mrs. Maria Joy and Robert Kvasnicka of the National Archives, who were helpful in suggesting and locating unpublished documents; to Dr. Harry Pfanz and Barry Mackintosh of Park Historic Preservation, William R. Failor, Superintendent of the C & O Canal NHP, Supervisory Historian John F. Luzader, Historical Architect Thomas N. Crellin, and Editor Linda Wedel Greene for reviewing the manuscript and providing helpful suggestions.

Harlan D. Unrau
October 23, 1974

Preface to the Electronic Edition

Harlan Unrau's original document was transcribed in 2006 and formatted for publication as a pdf document in 2012. Some minor editing was done to the document and some rearrangement of the "Administrative Data". Also additional photographs were added at the end.

The process of transcribing the C&O Canal NHP's historic resource studies (HRSs) and historic structure reports (HSRs) has been a multiyear project by volunteers with the park for the purpose of making these valuable documents available in searchable electronic form for the use of staff and the public.

Karen M. Gray, Ph.D.
Volunteer in the Library,
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August 23, 2012

Chronology

1828:

October 21: Canal company advertises for bids for construction of Dam No. 2

December 10: proposal of Dibble, Beaumont and McCord accepted for construction of Dam No. 2

December 31: Engineer Roberts reports to canal board on specifications for guard lock and feeder adjacent to Dam No. 2

1829:

January 24: Dibble, Beaumont and McCord formally sign contract for Dam No. 2

March 14: Contract for Seneca Falls Feeder and Guard Lock No. 2 let to Holdsworth and Isherwood

May–June: Construction operations commence on Dam No. 2 complex

1830:

May: Dibble, Beaumont and McCord released from contract for Dam No. 2

September: Contract to finish Dam No. 2 let to Obadiah Gordon

September 1830: Canal between Little Falls and Seneca Falls watered

1831:

May: Guard Lock No. 2 and Seneca Falls Feeder completed

Spring: Dam No. 2 completed

1832: July: Engineer Purcell directed to form a harbor at the entrance of the Seneca Falls Feeder

1849–1850: Guard bank built to prevent river from overflowing the canal behind Dam No. 2

1852: April: Guard Lock No. 2 damaged by freshet

Administrative Data

Name of Structure

Dam No. 2, Chesapeake and Ohio Canal National Historical Park,
Seneca, Montgomery County, Maryland.

The Seneca Falls Feeder and Guard Lock No. 2 are associated structures in the Dam No. 2 complex.

Statement of Historical Significance

Dam No. 2 and its associated structures are significant architectural and engineering resources because of their importance to the operation of the Chesapeake and Ohio Canal. Located approximately three fourths of a mile below the mouth of Seneca Creek, Dam No. 2 was constructed to supply water from the Potomac River for the 16.6-mile stretch of the canal down to Dam No. 1 at Little Falls. The Dam No. 2 complex was significant in that it was the western terminus of canal navigation for three years (18431-34) until construction of the waterway was completed to Harpers Ferry.

Proposed Use of Structure

The List of Classified Structures for the Chesapeake and Ohio Canal National Historical Park has not been completed. Therefore, the Order of Significance of Dam No. 2 and its associated structures has not been established nor has the level of treatment been determined. The draft master plan for the canal proposes that the 1.6-mile stretch of the canal between Lock No. 23 and the Seneca Quarries, on which the Dam No. 2 complex is located, be developed as a National Interpretive Center for high-density visitor use with fully restored resources capable of interpreting the story of the canal operation. Since management's concept of development for this area "is that of an outdoor living history museum" where "historical accuracy is imperative" in recreating the historical scene, the present program proposes the stabilization/preservation of the Dam No. 2 complex and recommends consideration of its future restoration.

Justification for Such Use

Dam No. 2 and its associated structures are significant architectural and engineering resources. The complex was important to the operation of the Chesapeake and Ohio Canal in that it supplied water for the 16.6-mile stretch of the canal down to Dam No. 1 at Little Falls. For this reason, the complex should be given immediate appropriate stabilization/preservation treatment, and serious consideration should be given to its future restoration.

Provision for Operating Structure

The present program recommends that Dam No. 2, Guard Lock No. 2, and the Seneca Falls Feeder be employed to interpret the construction, maintenance, and operation of the canal.

Cooperative Agreement, if any, Executed or Proposed for Operating Structure

Because the State of Maryland owns some property at Seneca that is part of Seneca State Park, the National Park Service will have to enter into a cooperative use agreement with the State before the “National Interpretive Center” concept is commenced. Since one abutment of the dam would lie on land belonging to the State of Virginia, any future full-scale restoration of the entire structure would necessitate prior consultation with the Virginia authorities.

A definite description of Proposed Construction Activity

A definitive description of proposed construction activity cannot be made for the Dam No. 2 complex until all studies have been completed. However, it is imperative that appropriate stabilization/preservation treatment be given immediately to these structures to prevent their further deterioration.

Recommendations

The records pertaining to the Chesapeake and Ohio Canal Company in the National Archives, the Library of Congress, the Maryland State Archives at Annapolis, the Maryland State Historical Society at Baltimore, and the C & O Canal NHP headquarters had been examined for this report. Therefore, it is the opinion of the author that no further historical research needs to be done on Dam No. 2 and its associated structures.

However, it is recommended that an interpretive study and archeological dig be conducted on the nearby site of Rushville, a small community that profited from canal commerce when the dam served as the western terminus of the waterway but that faded with the westward expansion of the canal. This interpretive study should ultimately be broadened to include all of the towns along the line of the canal whose economic development was influenced by the construction of the waterway.

I: The Construction of Dam No. 2, 1828–1833

During the weeks following the ground-breaking ceremonies at Little Falls on July 4, 1828, the canal directors turned their attention to the preparations for construction of the waterway. The board determined upon the location and dimensions of the canal, drew up a set of general specifications for the various structures to be built, and selected a staff of engineers to supervise the work.¹

On October 18 the board resolved that the “portion of the Canal between Rock Creek and Section No. 1 be put under contract at such time as the Chief Engineer may recommend together with the feeders at Monocacy & Seneca—and two dams across the Potomac.” At the same meeting, Chief Engineer Benjamin Wright set December 4 as the date for this letting.²

Three days later the following advertisement appeared in the *National Intelligencer*:

Proposals will be received at the office of this Company, in the city of Washington, until 4 o’clock, P.M. on the 4th day of December, 1828, for the excavation, embankment, and walling of the residue of the first fifty miles of the Chesapeake and Ohio Canal, comprehending the feeders at the mouth of the Monocacy and of the Seneca Rivers; and the portion of the Canal between Rock Creek, and the section now under contract next below the Little Falls of Potomac river, making about ten miles of Canal excavation. At the same time, proposals will be received for erecting three dams across the Potomac river, four locks, two basins, and several bridges.

The plans and specifications for the above work will be exhibited at this office after the 25th day of November.³

On December 6 an advertisement appeared in the same paper extending the time for receiving proposals for these works. Bids could be placed “until 4 o’clock, P.M. on Monday, the 8th inst.,” and the offers would “be decided upon at the Office of the Board of Engineers in Georgetown, on the 10th inst.”⁴

After considering the various proposals on December 10 the board accepted the bids of Dibble, Beaumont and McCord for the construction of Dams Nos. 1 and 2. The proposals for the feeder and guard lock at Seneca Falls (Dam No. 2) were referred to Chief Engineer Wright to review.⁵

¹ See Appendix A for the “Specifications for Dams,” (ca. 1828). All manuscript source materials referred to in this report are deposited in the Department of the Interior files at the National Archives and are designated Record Group 79.

² *Proceedings of the President and Board of Directors*, A, 92.

³ *National Intelligencer*, Oct. 21, 1828. Plans for the Monocacy and Seneca feeders were soon dropped.

⁴ *Ibid.*, Dec. 6, 1828.

⁵ *Proceedings of the President and Board of Directors*, A, 127-28.

Nathan S. Roberts of the Board of Engineers reported to the directors on December 31 concerning the specifications for the guard lock and feeder at Seneca Falls. The specifications and estimates that he reported to the board of directors were as follows:

The Guard Lock is to be built in the regular form of a Lock. Cut stone as required only in the hollow quoins, the rest is to be rubble & hammered work, laid in common lime mortar except the part immediately at the head of the upper Gates which is to be level in cement. The coping to be well joisted & well hammered & three feet wide—the upper surface cut, or scabbled—the height to be equal to a 9 feet lift.

The measurement by the perch of stone laid including everything. It is to be understood that there is neither breast work nor culverts to this Lock, but four large paddle gates in each Gate. The Gates are to be framed with dovetail tenons, to be wedged into the Posts. T & L's and bolts and nuts are dispensed with. The upper gates may be required to be 3 feet higher than the lower ones. The gate fastenings & cramping, the coping similar to other Locks. The Lock may be required to be of the same length & width of other Locks. The feeder & Lock pit to be excavated about 180 feet in length, and about 30 feet wide on the water line. The Bank is 250 feet long and is to be arched over in such manner as to permit the water in floods to pass over it without injury.

The excavation will be in part Rock, some of which is to be blasted & especially at the entrance of the feeder, some of which is loose & some solid. The Guard Lock is to be placed near the lower end of the feeder.

The propositions are to be for

Excavation of Earth	per cubic yard
Excavation of Loose Rock	per cubic yard
Excavation of Rock requiring Blasting	per cubic yard
Laying clay into the bank	per cubic yard
Slope wall & arch work to protect the banks and the side of the River —when the Rock is found in the excavation	per cubic yard
Slope wall as above when the stone is brought $\frac{1}{2}$ or $\frac{3}{4}$ of a mile	per cubic yard
Gravel to tighten the slope wall & arch on the bank	per cubic yard

The quantity of each material is estimated as follows:

Of Excavation of Earth	2,523	cubic	including Loose Rock
	yds.		
Of Excavation Solid & Loose Rock	300	cubic yds.	at entrance of feeder
Of Embankment at head of Lock	2,260	cubic yds.	clay to be obtained in the canal below the Guard Lock after it has been excavated from canal
Of paving & arching the Guard bank	1,140	perches	The stone, except what comes out of the excavation, to be brought between $\frac{1}{2}$ & $\frac{3}{4}$ of a mile
Gravelling the Bank	915	perches	Between $\frac{1}{4}$ & $\frac{1}{2}$ mile distance

Paving the River bank above Lock 571 perches stone obtained as above⁶

At their meeting on January 21, 1829, the board approved the report by Roberts regarding the estimates and specifications for the Seneca Falls guard lock and feeder. The directors ordered the Board of Engineers to receive proposals for executing the work and to submit the bids to them for consideration.⁷

Dibble, Beaumont and McCord arrived at the canal company office in Washington on January 24 “to enter into formal contracts” for the construction of Dams Nos. 1 and 2. When the contracts were reviewed, it “was found that no provision had been made for . . . necessary iron work in the construction of . . . the dams across the Potomac.” After some discussion it was agreed “that ten cents per pound be paid to the said contractors for all necessary iron, worked and used.”⁸

On March 14 the board let the contract for the Seneca Falls guard lock and feeder to the firm on Holdsworth and Isherwood. The prices that these men were to be paid for the guard lock were as follows:

Excavating the Lock pit at 25 cts. per cubic yard
Embanking the Lock at 12-1/2 cts. per cubic yard
For constructing the lock including all materials with cut stone, hollow quoins and coping at \$4.25 cts. per perch.

The prices to be paid for the feeder were as follows:

Excavation of Earth at 18-3/4 cts. per cubic yard
Excavation of loose rock at 25 cts. per perch
Rock requiring blasting at 75 cts. per perch
Laying clay into the bank at 20 cts. per cubic yard
Slope wall and arch work to protect the bank at \$1.20 cts. per perch
Gravel to tighten the slope wall and arch on the bank at 60 cts. per cubic yard⁹

Before actual work on Dam No. 2 commenced, there were several proposals submitted to the board to alter the plan of Dams Nos. 1 and 2. On January 24 Henry Boteler submitted to the board a plan for constructing the dams of wood.¹⁰ In mid-April another proposal was made to the board “to form them [Dams Nos. 1 and 2] of wood and stone combined.” This latter plan was

⁶ Roberts to Ingle, Dec. 31, 1828, Drawings and Other Records Concerning Construction, C & O Co. A copy of Roberts’s specifications and estimates for the guard lock and feeder at Seneca Falls may be seen in Appendix B. Roberts also included a “Table of Areas in Square Feet of Segments of a Circle to the Diameter of 29 Ft.—Intended to Calculate the Seneca Dam.” A copy of this table may be seen in Appendix C. Because the guard lock was “to be built in the regular form of a Lock,” a copy of Inspector of Masonry Robert Leckie’s instructions of July 3, 1829, to Resident Engineer Thomas F. Purcell concerning the construction of the masonry locks may be seen in Appendix D.

⁷ *Proceedings of the President and Board of Directors*, A, 146.

⁸ *Ibid.*, p. 150

⁹ Contract for Seneca Falls Guard Lock and Feeder, Mar. 14, 1829, Drawings and Other Records Concerning Construction, C & O Co. A copy of this contract may be seen in Appendix E.

¹⁰ *Proceedings of the President and Board of Directors*, A, 148-49.

referred to John Martineau, a member of the board of engineers, with instructions “to report a plan, and estimate of the cost, as now proposed.”¹¹

On June 1 the first assessment was taken on the work done on Guard Lock No. 2. By that date the contractors had excavated 1, 295 cubic yards for the lock pit at the cost of \$323.75¹²

The first assessment of work done on Dam No. 2 was taken on July 1. The contractors had accomplished the following work:

598.14 perches, arch completed @ \$1.25	\$ 447.67
421 feet lineal of timber @ \$.08	33.68
600 perches of stone quarried and boated @ \$.60	360.00
1,000 perches of stone quarried @ \$.30	<u>300.00</u>
	\$1,441.45 ¹³

Inspector of Masonry Robert Leckie sent the following letter concerning the construction of Dam No. 2 to Engineer Wilson M. C. Fairfax on July 10:

The dam at Seneca, being a very important part of the necessary appendages of the canal, a great deal of attention should be paid to its construction and your attention is respectfully requested to the following principles.

When the rocks do not form a sufficient hold for the abutment or traveins of the dam a stepping blast should be put in and a part blasted out to hold the first stone securely.

When the water is deep these timbers must not only be well secured by dovetailed ties but be Bolted down to the rocks on which they rest; these should be set a strong 1-1/4 inch bolt with a large head put in every 6 or 8 feet.

The holes in the rocks to hold the bolts should be Chambered, that is the bottoms of the hole should be wider than the top; this is effected by using at the bottom a drill only half the size of the one as the one used in boring the hole and working it all round which will widen it at the bottom; the bolt is then split in the bottom part and a wedge put in and driven hard down so that the battern of the bolt will fill the wide part of the hole.

In places where there is flat rock but not depth enough to admit of timbers being put in, long wedge shaped stone should be used to be secured in front by 1-1/2 inch plugs let at least 9 inches into the rock with foxing wedges in the bottom as before described.

When the water is very low advantage should be taken to put in plugs in front of the long stone already laid for the toeing and into the front timbers where they can be used.¹⁴

¹¹ *Ibid.*, pp. 204-5. Martineau later recommended to the directors that the dams be built according to the original printed specifications.

¹² Assessment Book for Sections 19-38, C & O Co.

¹³ *Ibid.*

¹⁴ Leckie to Fairfax, July 10, 1829, Ltrs. Recd., C & O Co.

On July 22 Lewis Sewall, keeper of the old Potomac Company's locks at Great Falls, informed the board "that the construction of the dam at Seneca would interrupt the navigation of the river, unless the high water passes at that place." Accordingly, the board ordered that the resident engineer "cause such improvements to be made there [Seneca Falls], as he may find to be necessary."¹⁵

Assessments of work done on Dam No. 2, Guard Lock No. 2, and the Seneca Falls Feeder were made on August 1. As of that date, the following work had been finished on Dam No. 2 by Dibble, Beaumont and McCord:

955 perches of arch completed @ \$1.25	\$1,193.75
2,010 perches quarried and boated, not arched @ \$.60	\$1,206.00
969 perches quarried @ \$.30	\$290.70
560 feet of timber @ \$.08	<u>\$44.80</u>
	\$2,735.25

The following work had been done on Guard Lock No. 2 and the Seneca Falls Feeder by Holdsworth and Isherwood:

1,676 cubic yards, excavation of lockpit @ \$.25	\$ 419.00
301 cubic yards, excavation for feeder @ \$.18-3/4	\$56.44
53 cubic yards, excavation of rock blasted for feeder @ \$.75	\$39.75
650 cubic yards, embankment for feeder @ \$.20	<u>\$130.00</u>
	\$ 645.19 ¹⁶

During the fall and winter, the firm of Dibble, Beaumont and McCord virtually ceased construction operations on Dam No. 2. However, Holdsworth and Isherwood continued their work on the guard lock and feeder. An assessment taken on January 6, 1830, of work done by this latter firm indicated the following:

1773 cu. yds. of excavation @ \$.25	\$ 443.15
380 perches of masonry @ \$4.00	\$1,520.00
301 cu. yds. excavation for feeder @ \$.18-3/4	\$ 56.43
53 cu. yds. excavation rock blasted for feeder @ \$.75	\$ 39.00
650 cu. yds. embankment for feeder @ \$.20	<u>\$ 130.00</u>
	\$ 2,188.58 ¹⁷

In early January the board reviewed the progress of the work between Rock Creek Basin in Georgetown and Seneca Falls. Although the company had originally set December 31, 1829, as the date when this entire section should be finished, the directors were satisfied that most of the

¹⁵ *Proceedings of the President and Board of Directors*, A, 312.

¹⁶ Assessment Book for Sections 19-38, C & O Co.

¹⁷ *Ibid.*

work still remaining to be done would be completed in a reasonable period of time. In some cases where contractors had made insufficient progress, such as on Dam No. 2 and its associated structures, the board decided to extend the date of expected completion of the contracts to June 1. To assure that the works would be finished by that date, the board reserved the right to declare the contracts forfeited any time it was found that the contractors had an insufficient force at work.¹⁸

As inflation continued to raise the cost of construction, many contractors on the canal were forced to reduce their operations and ask for cash advances on their work. On February 5 the firm of Dibble, Beaumont and McCord requested and received a \$1,000 advance on their contracts.¹⁹

As their finances continued to worsen, the firm asked the board on March 24 to reexamine the assessments made to them for work done on Dams Nos. 1 and 2. As a result, the board ordered an advance of \$500 to the contractors and referred the assessments to Chief Engineer Wright for his review.²⁰ One week later Wright reported to the board that the contractors were entitled to more money than the sums they had received for work on the dams. After further discussion, the board directed that the firm be given another advance of \$1,500.²¹

The firm of Holdsworth and Isherwood also was experiencing difficulty in completing the guard lock and feeder at Seneca Falls. An assessment taken on March 9 of work done on Guard Lock No. 2 and the feeder revealed that work on those structures had virtually ceased. Since January 6 the only work that had been done was the placement of thirty-one perches of hammered stone in the face of the guard lock.²²

Two weeks later, on the twenty-fourth, the contractors informed the board that they were financially unable to continue their contracts, which included Aqueduct No. 1 and Locks Nos. 21, 23, and 24 in addition to the guard lock and feeder. As a measure of short-term relief, the board extended an advance of \$500 to the contractors on April 7.²³

Resident Engineer Purcell, on May 10, sent a letter to Dibble, Beaumont and McCord informing them that President Mercer wanted work on Dam No. 2 resumed immediately.²⁴ Nine days later President Mercer notified the board that the firm of Dibble & Co. desired to be released from their contracts for Dams Nos. 1 and 2. Because it was the opinion of the chief engineer “that it was unnecessary at this time to progress further with that work,” the board agreed to release the contractors from their obligation to complete Dams Nos. 1 and 2 and ordered a final assessment to be made of work done on these structures.²⁵ The final assessment on Dam No. 2 was taken on June 7:

¹⁸ Ingle to Purcell, Jan. 13, 1830, Letter Book of the Resident Engineer of the 1st Residency of the 1st Division.

¹⁹ *Proceedings of the President and Board of Directors*, B, 22.

²⁰ *Ibid.*, p. 48.

²¹ *Ibid.*, A, 52, 57.

²² Assessment Book for Sections 19-38, C & O Co.

²³ *Proceedings of the President and Board of Directors*, B, 49, 54.

²⁴ Purcell to Dibble, May 10, 1830, Letter Book of the Resident Engineer of the 1st Residency of the 1st Division.

²⁵ *Proceedings of the President and Board of Directors*, B, 74. Also see Ingle to Purcell and Cruger, May 19, 1830, Letter Book of the Resident Engineer of the 1st Residency of the 1st Division.

955 perches of arch completed @ \$1.25	\$1,193.75
2,010 perches quarried and boated, not arched @ \$.80	\$1,608.00
939 perches quarried, not boated @ \$.55	\$ 516.45
280 feet of timber (round) @ \$.08	\$ 22.40
280 feet of timber hewn @ \$.12	\$ 33.60
For iron work	\$ 46.00
For extra labor	<u>\$ 6.00</u>
	\$3,426.20 ²⁶

Meanwhile the pace of work had been increasing on the guard lock and feeder. An assessment taken on May 12 of work done on these structures showed that since March 9 more than 650 cubic yards of earth had been excavated and 641 perches of mortared masonry had been laid.²⁷

At the second annual meeting of the canal company stockholders on June 7, the directors announced that they expected to bring into use twenty of the new locks, and the entire canal, from Seneca to the old locks below the Little Falls, by the next fourth of July; a period of two years from the nominal, and but little more than eighteen months from the actual commencement of the Chesapeake and Ohio Canal.²⁸

On July 3 of the following month the Niles' Weekly Register reported that "water would be let into that part of the canal between the Little Falls and Seneca on the 5th July, - but it will not be filled for a considerable time." A packet boat, which would "afford a delightful excursion" for passengers, was being built for use on the canal.²⁹

Through much of the summer, work on Dam No. 2 was at a standstill, for no new contractor had been found to complete the structure. However, Holdsworth speeded the construction of the guard lock and feeder at Seneca Falls so that these two structures were nearly completed by late July. During this month, separate assessments were taken of the work done on these structures:

Guard Lock No. 2

2,430 cu. yds. excavation @ \$.25	\$ 607.50
1,192 perches of masonry @ 4.25	5,066.00
450 cu. yds. embankment @ .12-1/2	<u>56.25</u>
	\$5,729.75

Feeder

718 cu. yds. excavation @ \$.18-3/4	\$134.62
564 cu. yds. excavation, rock blasted @ .75	423.00
650 cu. yds. embankment @ .20	130.00

²⁶ Assessment Book for Sections 19-38, C & O Co.

²⁷ Ibid. After Contractor Isherwood became very sick, all the contracts with the canal company were transferred to Holdsworth. See *Proceedings of the President and Board of Directors*, B, 68.

²⁸ *Second Annual Report* (1830), C & O Co., p. 6.

²⁹ *Niles' Weekly Register*, July 3, 1830, vol. 38, p. 328.

203 cu. yds. embankment of gravel @ .60	121.80
601 perches of arch and slope wall @ 1.20	721.20
Grubbing & clearing	30.00
Temporary Dam	30.00
	<hr/> \$1,590.62 ³⁰

On August 7 Obadiah Gordon sent a proposal to the board to complete Dam No. 2 at \$1.50 per perch. The board referred the bid to Engineer Alfred Cruger “with instructions to inquire into the expediency of extending or finishing the said Dam.” If it was deemed expedient to complete or extend the dam, the board agreed that President Mercer should let a contract “at a price not exceeding \$1-37 1/2/100 per perch, with the proviso, that the work may be discontinued at the pleasure of this Board, and also upon the condition that a due allowance be made by the contractor for stone furnished.”³¹

The board, on September 25, authorized President Mercer “to acquire for the Company’s use such part, or if necessary, the entire island in the middle of the dam now constructing at the Little Falls, and also the abutments of the said Dam and of that at Seneca on the Virginia shore.” At the same time the directors determined that “contracts be made for completing the said dams by suitable embankments of stone, earth or gravel on their upper side.”³² Later, on October 9, the board ordered “that Dam No. 2 be made water tight by the use of gravel.”³³

Daniel Van Slyke, the superintendent of the canal, informed the board on October 2 of conditions on the waterway:

I have to report that the Canal generally is in good repair. A boat passed through it yesterday from tide water to the head of Seneca Falls. A breach occurred last night in an Embankment near the lower end of Sec. 15 to repair which fully, four or five days will be occupied. I apprehend danger from the want of inexperienced Lock Keepers. Notwithstanding the most explicit instructions I find daily the most alarming cases of neglect owing chiefly to a want of knowledge of their duties which time only can remedy. I propose however to place one man of some experience at the Locks on the 8th & 9th Sections and another of the same character at the Locks on the 17th & 18th Sections.³⁴

That same day Chief Engineer Wright informed the directors that the original plan for Dams Nos. 1 and 2 called for a quantity of gravel to be applied to their upper sides. The gravel was to be placed nearly to the top of the dams and “slope off upstream at an angle of descent of about 15 degrees.” Because this part of the plan had been ignored, he urged that this work be done immediately.³⁵

³⁰ Assessment Book for Sections 19-38, C & O Co.

³¹ *Proceedings of the President and Board of Directors*, B, 157. Although the C & O Canal Company records do not indicate that a formal contract was let to Gordon, he received a payment of \$1,500 on September 13 based on his monthly estimate of work done on Dam No. 2. See *ibid.*, p. 177.

³² *Ibid.*, pp. 188-89.

³³ *Ibid.*, p. 199.

³⁴ Van Slyke to Board of Directors, Oct. 2, 1830, Ltrs. Recd., C & O Co.

³⁵ Wright to Board of Directors, Oct. 2, 1830, Ltrs. Recd., C & O Co.

Two weeks later, on the fifteenth, Van Slyke assured the directors that they “may with confidence rely on being able to pass through the canal to Seneca in a boat” on October 21. By that date the engineers would “have full opportunity to test the several parts on which repairs and improvements are still deemed important.”³⁶

On October 21 an assessment of work done on Dam No. 2 showed the following:

3,285 perches, arch completed @ \$1.37-1/2	\$4,516.87-1/2
1,163 perches, quarried but not boated @ \$.60	<u>697.80</u>
	\$5,214.67-1/2
Deduct 615 perches of stone delivered by former contractor @ \$.60	\$369.00 ³⁷

At the urging of the board, Gordon quickened the pace of the work on Dam No. 2 in the fall. Estimates by company engineers show that by the first of November, 3,511 perches of stone had been completed on the arch of the dam and another 851 perches had been delivered at the construction site. By the fourth of December, 4,713 perches of the arch had been completed, 1,205 perches had been delivered to the site, and an additional 500 perches had been quarried.³⁸

The board, on January 4, 1831, directed Resident Engineer Thomas F. Purcell “to report a plan and estimate of the cost, for producing still water at the entrance to Guard gate [Lock] No. 2, so as to admit boats into the Canal, safely, in times of high water.” His proposed plan “to erect a harbour for boats at the entrance from the feeder at Dam No. 2” was presented to the board on March 4 and in turn referred to President Mercer for review.³⁹

A freshet swept through the Potomac Valley in mid-February, causing severe damage to the canal just below Dam No. 2. Superintendent Van Slyke, on February 24, reported to the board that:

where the water has been admitted or retained in the Canal to an elevation as great as that in the river, no damage to the canal has been sustained. This has not been the case everywhere, except on the level immediately below the Seneca Guard Lock,. . . here a disaster of some moment has occurred.⁴⁰

The canal between Little Falls and Seneca was opened for navigation on April 1. On April 9 the *Niles’ Weekly Register* noted that “thirty thousand barrels of flour, with much other merchandise, descended that part of the Chesapeake and Ohio canal [23 or 24 miles], which is completed, since the water was let in.”⁴¹

³⁶ Van Slyke to Board of Directors, Oct. 15, 1830, Ltrs. Recd., C & O Co.

³⁷ Assessment Book for Sections 19-38, C & O Co.

³⁸ *Ibid.*

³⁹ *Proceedings of the President and Board of Directors*, B, 251, 272. A thorough search of the C & O Canal Co. records at the National Archives failed to turn up any details of this plan.

⁴⁰ Van Slyke to Mercer, Feb. 24, 1831, Ltrs. Recd., C & O Co. The culvert just below the guard lock was broken open by the force of the water.

⁴¹ *Niles’ Weekly Register*, Apr. 9, 1831, vol. 40, p. 95. The board anticipated that Seneca, as the first western terminus of the canal, would develop as a small community because of the canal trade, the large pool formed by Dam No. 2, and the possibility of waterpowered manufactories along the canal banks. The directors named the site of the pro-

Although navigation was commenced on the canal, Dam No. 2 was still unfinished. Gordon, with the aid of Elias Gumaer, began graveling the dam in spring as the board had directed the previous fall. By May 5 a total of 1,800 perches of the arch of the dam had been graveled at 12-1/2 cents per perch.⁴²

Engineer Cruger reported to the board on May 6 that Holdsworth had requested a further allowance of \$197 for excavating the pit of Guard Lock No. 2. The board approved the additional allowance on “the condition that R. Holdsworth make the said Lock water tight to the satisfaction of the Resident Engineer.” The final estimate for the guard lock and feeder was then accepted. All together, Holdsworth had been paid \$7,338.99 and \$1,590.62 for the construction of Guard Lock No. 2 and the Seneca Falls Feeder respectively.⁴³

In June Lieutenant Colonels John J. Abert and James Kearney of the Topographical Corps of the Army made a survey of the canal from Georgetown to Seneca “by order of the President of the United States, at the request of the president and directors of the Canal Company.” These engineers reported favorably on the quality of construction along the line of the waterway and on its existing condition. Concerning the Dam No. 2 complex, the engineers observed:

Lock No. 23 has a lift of eight and a half feet, and immediately adjacent to it is a guard and lift-lock No. 24, communicating with the Potomac River.

These two locks were laid throughout with the cement, or hydraulic mortar, and no grout was used. The facing, or front ranges of masonry, are of the red sandstone of Seneca. They had the appearance of faithful workmanship. We were informed that at one time a spouting of water had been observed from the side walls of these locks, immediately after being emptied; but we observed nothing of the kind when we examined them.

The canal is fed from the river through the guard and lift-lock No. 24. It is generally called the Seneca feeder. An arched stone dam, two thousand five hundred feet long, and adapted to raise the water six feet above low water mark, is here thrown across the river, and directs the water into the lock. The chamber of this lock is of the same size as that of the lift-lock. It is in active use in passing boats between the canal and the river, and bestows the advantages of the canal to the country on both shores.⁴⁴

spective development Rushville in honor of ex-Secretary of the Treasury Richard Rush who had negotiated the loan from Dutch capitalists that enabled the District cities to pay their subscriptions to the canal stock. See Walter Sand-
erlin, *The Great National Project* (Baltimore, 1946), p. 164.

⁴² Assessment Book for Sections 19-38, c & O Co.

⁴³ Proceedings of the President and Board of Directors, B, 313. Also see U. S., Congress, House, Committee on Roads and Canals, *Chesapeake and Ohio Canal: Report to Accompany H.R. 94*, 23d Cong., 1st sess., 1834, H. Doc 414, p. 179 (hereafter cited as *House Report 414*).

⁴⁴ *Report of Col. John J. Abert and Col. James Kearney of the United States Topographical Engineers, upon an examination of the Chesapeake and Ohio Canal from Washington City to “Point of Rocks”* (Washington, 1831), reprinted in *House Report 414*, p. 97. Guard Lock No. 2 is incorrectly identified in this report as Lock No. 24. Later canal company correspondence indicates that this was a printing error.

On September 9 Resident Engineer Thomas F. Purcell reported to the board on the need to repair and gravel Dam No. 2. Accordingly, the board directed him to superintend the graveling and to report the cost of the first 100 yards of such work.⁴⁵

At their meeting on October 28 the board took up for discussion Purcell's recommendation that harbor be built at the entrance of the Seneca Feeder. The directors referred the report back to Purcell and also ordered that he submit information to them on "the probably cost of raising the eastern end of Dam No. 2 for a sufficient distance and of a sufficient height to form a harbor there which shall be safe at all stages of the water in the river."⁴⁶

After further discussion of the Seneca harbor, the board, on July 7, 1832, instructed Purcell to deepen the entrance of the Seneca Falls Feeder. To accomplish this, Purcell was ordered "to cause the Rocks, in the approach to the Seneca feeder, in the river, near and just above the Dam, to be removed, and also the ledge in the Canal, next the feeder." In addition to these improvements, the board instructed Purcell to repair the breaches in the dam with brush and stone, the latter material "to be taken from the Roads formed above the Canal on the 35th and 36th Sections." As he executed the repairs, Purcell was to "distinguish in his monthly reports, between the expenses incurred in repairs and those properly chargeable, for additions to, or improvements of, the Canal."⁴⁷

During the spring of 1833 the improvements to Dam No. 2 were completed, although restoration work on the structure continued to be paid out of its construction account until 1841. All told, the company had paid out \$26,978.95 to the contractors in securing the completion of Dam No. 2.⁴⁸

⁴⁵ *Proceedings of the President and Board of Directors*, B, 455; C, 10, 13.

⁴⁶ *Ibid.*, C, 20.

⁴⁷ *Ibid.*, pp. 184, 194.

⁴⁸ *House Report 414*, p. 179. Also see Ledger Book A, C & O Co.

II: Dam No. 2, 1833–1974

The loose rock plan of Dam No. 2 made it extremely vulnerable to damage from water and ice freshets. On August 16, 1833, the board directed Engineer William H. Bryan to repair Dam No. 2 “after the manner of the repairs thereof [stone and brush] made last year.”¹

Board member Walter Smith, on August 16, 1837, reported that he had received complaints about Dams Nos. 2 and 4. Because of “the imperfect state” of Dam No. 4, there was an inadequate supply of water in the canal between Big Slackwater and Harpers Ferry. The movement of boats through the Seneca Guard Lock had been hindered because of a sandbar near its inflow. Superintendent John Y. Young was directed to remove the obstruction.²

Dam No. 2 was again badly in need of repairs in May 1839, and Superintendent John Y. Young was directed to restore the dam to its original dimensions.³

Because of the desperate financial condition of the canal company by 1843, the board took numerous measures to cut the costs of operating the waterway. The directors ordered that “the Superintendent of the 1st Division of the Canal shall reside, from and after the 1st day of August next, at Seneca.” The superintendent would serve as the “keeper of Lock No. 23 and Guard Lock No. 2 & shall receive the compensation now paid for the performance of that service.”⁴

While pushing the completion of the canal to Cumberland in the years 1848-50, the company also turned its attention to that portion of the waterway between Georgetown and Dam No. 6. The old part of the line, this section was now badly in need of repair. In April 1849 the State of Virginia came to the rescue of the financially hard-pressed company by authorizing the guarantee of \$200,000 worth of repair bonds to be issued by the company. The renovation work was then pushed so that the entire line would be ready for the formal inauguration of the canal.⁵

John Lambie, superintendent of the 1st Division, informed President Coale on August 15, 1849, that Dam No. 2 was in poor condition. Because part of the dam had washed away, the feeder level at Seneca was “so low that heavy loaded boats cannot pass over it.”⁶

Nine days later Lambie reported to Chief Engineer Fisk that he had been unable to “get the bar on the Seneca level all taken out in the short time that the water was out.” Although he had deep-

¹ *Proceedings of the President and Board of Directors*, C, 414.

² *Ibid.*, E, 302.

³ *Ibid.*, F, 61.

⁴ *Ibid.*, G, 44. The salary for the lock keeper was \$200 per year, and the annual rent of the Rushville lock house was \$100.

⁵ Sanderlin, *Great National Project*, pp. 158-59.

⁶ Lambie to Coale, Aug. 15, 1849, Ltrs. Recd., C & O Co.

ened the level about sixteen inches, it was still “nearly as much above bottom.” However, loaded boats had been able to pass through without difficulty.⁷

The canal between Locks Nos. 23 and 24 above Dam No. 2 having been subject to periodic flooding for years, it was decided that a stronger guard bank should be constructed in the vicinity of the dam. On May 18, 1850, Engineer William H. Bryan submitted three plans and estimates for this guard bank to Fisk for his review.

According to Bryan, if the guard bank was constructed on the towpath side of the canal, Dodge, a determined landowner at Seneca, insisted “that the cross bank to the hill be made in the line AB which is more costly than that first estimated on the ridge CD” (see sketch, p. 14). On the other hand, if the improvement were made on the berm side of the canal, Dodge demanded that “it shall be either upon the line EF or along the fence GH, and not along the line KL as at first estimated.” In either case, it would be necessary “to drain the pond, at least in part.” By building a small timber and plank culvert at M or W, a strong bank line could “be made from the Canal to the hill & upon Forrests’ land.”

Based on these plans, Bryan submitted the following estimates for the guard bank:

TOWPATH LINE

From Lock No. 23 to Lock No. 24 as at first planned at +10 & 12.4 – 6,379 cu. yds.	
Raising to +12 & 12.4 – 2,735 cu. yds.	
Add for probable additional strength around old culvert - 600 cu. yds.	
Total—9,714 cu. yds. @ \$.20	= \$1,943
From Lock No. 24 as required now by Dodge—2,000 cu. yds. @ \$.10	= 200
Probable moving of 360 panels in fencing @ \$.25	= 90
Land—2-1/2 acres @ \$50	= 125
Cost draining pond	= 50
Contingencies	= 200
	\$2,608

BERM LINE (from Lock No. 23 to & along the line EF to hill)

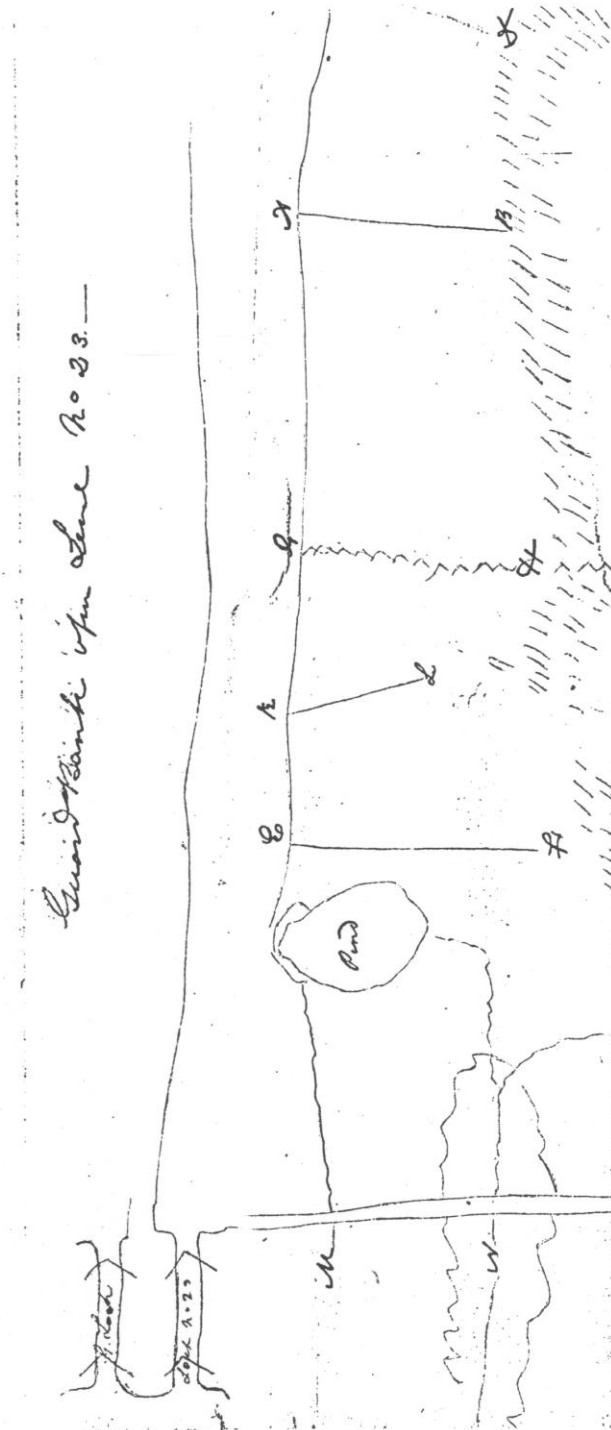
Raising head of Lock No. 23 10 + 10	= \$100
80 per.—70 + 4 = \$280	= 380
From Lock No. 23 to and over the pond at +12—3,691 cu. yds.	
Then to hill (along EF)—2,280 cu. yds.	
Total—5,971 cu. yds. @ \$.10	= 597
Mucking, puddling, etc.	
	= 150

⁷ Lambie to Fisk, Aug. 24, 1849, Ltrs. Recd., Chief Engineer. The cost of this work was \$736.17. See *ibid.*, Nov. 26, 1849, Ltrs. Recd., Chief Engineer.

Moving 100 panels fencing @ \$.25
 Castings

= 25
 = 150
 \$1,302

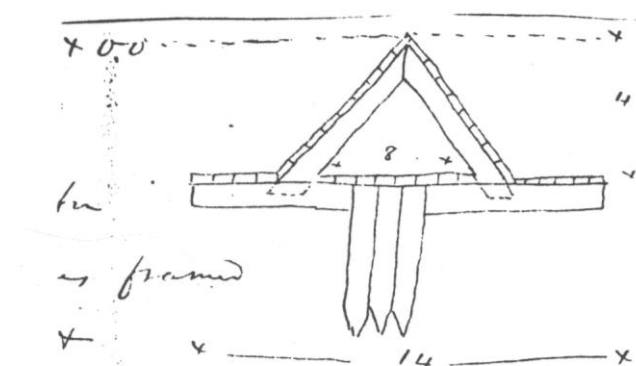
SKETCH OF GUARD BANK PROPOSALS ON LEVEL NO. 23



In the opinion of Bryan, this latter plan “would be better if the bank could be carried out along the line KL & it may be cheaper to extend it to the fence GH.” His third estimate, therefore, was based on building the guard bank on the berm side of the canal with the cross bank following the line GH:

Raising Lock No. 23 as above = \$ 380

Wooden culvert, to be kept under water and proposed to be made as follows:



54 feet long

20 pieces of timber for foundation—with pieces framed into them—floored and covered with 2 in. plank

3 rows sheet piling with well puddle over stone walling or ballast at lower end = 240

3,200 cu. yds. embankment - @ \$.15 = 480

1,300 cu. yds., puddle ditch @ \$.10 = 130

Mucking, puddling, etc. = 150

Castings = 150

\$1,530

Although earlier he had favored building the guard bank on the towpath side of the canal, Bryan now saw several advantages in constructing it on the berm side. The berm improvement would expose less of the bank to the action of the water, and the bank could be built while water was in the canal, permitting navigation to proceed during construction. Based on his estimates, the berm bank would also be less costly.⁸

Bryan, on June 8, reported to Chief Engineer Fisk on the condition of the Seneca feeder level and the bottom of Lock No. 23. It was difficult to drain this level of the canal because there was an average “of mud, sand and spur rock to a height [of] 16 or 17 inches above the m[itre] sill for about 1,200 feet below the Guard Lock.” To enable canal employees to remove the deposits and take out the rock, he urged Fisk not to rewater the canal until mid-August.

⁸ Bryan to Fisk, May 18, 1850, Ltrs. Recd., Chief Engineer.

Bryan feared that there was “rock below Lock No. 23 as high as one foot above bottom.” In view of these obstructions, he begged Fisk not to “hasten the restoration of the navigation.”⁹

Superintendent Lambie, on January 13, 1851, submitted a list of the general repairs made on the 1st Division from September 1, 1849, to December 31, 1850. During that period, a total of \$12,955.25 was spent on the guard banks to prevent the river from overflowing the canal behind Dam No. 2. This sum included the cutting of the ditch to drain the pond just above Lock No. 23. An additional amount of \$324.48 was spent on general repairs to Guard Lock No. 2.¹⁰

On June 14 Lambie reported to Fisk that he had sodded the guard bank at Dam No. 2 because it had washed badly. This work had been done at a cost of \$75.29.¹¹

In late summer, the level of the Potomac River fell dangerously low, causing the canal company great difficulty in getting an adequate supply of water for the operation of the canal. On September 13 Lambie informed Fisk that “we have put brush on the Dam at the Little Falls all the way across the river without being able to raise the water much in the Pond.” However, canal crews had “succeeded in raising it [the river] over the Dam at Seneca.” Consequently, a volume of water “between eight and nine cubic feet” was running from Seneca Falls to the Georgetown level.¹²

A flood hit the canal in mid-April 1852, devastating many parts of the waterway. The river rose six feet higher in some places than the levels attained by the flood of 1847, which had been the worst in sixty years.¹³ At Guard Lock No. 2 a breach 130 feet wide and 8 feet deep occurred in the embankment of the berm side of the structure. Another breach, 30 feet wide and 6 feet deep took place across the towpath about 60 feet west of the guard lock.¹⁴

At the annual meeting of the canal company stockholders on June 7, Chief Engineer Fisk estimated that \$80,000 would be needed to repair the flood damage. In a discussion of his estimate, Fisk reported:

In fact, if the aim were merely to restore the canal to the condition in which it was, before the freshet, a less sum and a shorter time would suffice. But it was thought best to aim at more than this, when it was found that an expenditure, at a few points, would prevent, should the same rise again occur, very nearly, if not, fully one-half the damage that would otherwise be done to the entire line of the canal. (These points alluded to, are five in number. They are, respectively, immediately below the Great Falls and the Seneca Falls, and in the neighborhood of Dams No. 3, 4, & 6. The length of the canal, sustaining damage, at these points, does not exceed, in the aggregate, six miles).¹⁵

⁹ *Ibid.*, June 8, 1850, Ltrs. Recd., Chief Engineer.

¹⁰ Lambie to Fisk, Jan 13, 1851, Ltrs. Recd., Chief Engineer. In January and February 1851, \$120.49 was spent in efforts to remove deposits from the Seneca Feeder level. See *ibid.*, Feb 28 and Mar. 17, 1851, Ltrs. Recd., Chief Engineer.

¹¹ *Ibid.*, June 14, 1851, Ltrs. Recd., Chief Engineer.

¹² Lambie to Fisk, Sept. 13, 1851, Ltrs. Recd., Chief Engineer.

¹³ *Twenty-Fourth Annual Report* (1852), C & O Co., pp. 3-4.

¹⁴ Elgin to Fisk, Apr. 25, 1852, Ltrs. Recd., Chief Engineer.

¹⁵ *Twenty-Fourth Annual Report* (1852), C & O Co., p. 21.

The sum of \$80,000 was loaned to the canal company by banks and individuals in Washington, Georgetown, Alexandria, and Cumberland to restore the canal. Of this amount, \$25,000 was needed by Superintendent Lambie of the 1st Division to make repairs from Georgetown to Dam No. 2. Superintendent Elgin of the 2nd Division, which covered the line of the canal between Seneca Falls and Harpers Ferry, was allotted \$5,000 for restoration work.¹⁶

When the repairs had been completed, Lambie, on September 1, sent the following list of expenditures for the Dam No. 2 complex to Fisk:

	MAY	JUNE	JULY	AMT.
Feeder Level at Seneca	\$1,099.07	\$1,757.63	\$624.39	\$3,481.09
Wall on Feeder Level at Seneca		\$850.00		\$850.00 ¹⁷

Engineer and General Superintendent T. L. Patterson informed the stockholders that:

The Dams at Little Falls and Seneca, require extensive repairs, to put them in permanent condition to preserve the water at a proper height, to supply the large quantity of water required for the lower end of the Canal. These repairs have been going on, during the last season, and will be continued, from time to time, as they can be made to advantage.¹⁸

On June 5, 1854, the board reported to the stockholders that the “dams from No. 5 to the Little Falls inclusive, having been badly constructed, and subsequently injured by freshets, required annual repairs; and have remained in an imperfect condition to the present time.” However, Dams Nos. 1 and 2 had been considerably improved by extensive repairs.¹⁹

Superintendent A. K. Stake, on June 11, 1856, notified the board that temporary repairs had recently been made on Dams Nos. 1 and 2 because of damage from an ice freshet. Because of these repairs, he was hopeful that the canal would have a full supply of water throughout the boating season.²⁰

Apparently Dam No. 2 was damaged by a spring freshet in 1863, because the superintendent of the Georgetown Division was instructed by the board on May 28 to make necessary repairs to Guard Lock No. 2 and to tighten the dam.²¹

The board, on June 4, 1866, announced to the stockholders:

Dams Nos. 4, 6 and 8 are in good condition and will require very little expenditure to keep them effective and reliable. Dam No. 1 at the little falls of the Potomac 1750 feet in length, and Dam No. 2 at Seneca falls, 2500 feet in length, are both dilapidated and ineffective for a

¹⁶ Ringgold to Chairman, Committee of Georgetown Corporation, June 16, 1852, Ltrs. Sent, C & O Co.

¹⁷ Lambie to Fisk, Sept. 1, 1852, Ltrs. Recd., Chief Engineer.

¹⁸ *Twenty-Fifth Annual Report* (1853), C & O Co., p. 9.

¹⁹ *Twenty-Sixth Annual Report* (1854), C & O Co., pp. 5-7.

²⁰ Stake to Board of Directors, June 11, 1856, Ltrs. Recd., C & O Co.

²¹ *Proceedings of the President and Board of Directors*, K, 338.

full supply of water when the river is low. They are both low dams, four or five feet above the river surface, founded on rock, built originally of stone laid dry; the interior of the dams filled with rubble stone, closely packed, with a cross section in the form of an arch. This arch has for the greater part given way, and the gaps have been filled in with brush, stone and gravel, forming “brush dams.” They will both require to be renewed to a great extent.²²

On July 12, 1870, Engineer William R. Hutton reported to the board concerning his estimates for putting the canal into good condition. Included in these estimates were the following recommendations for the Dam No. 2 complex:

Filling & graveling Seneca Dam (No. 2)	\$300
Excavation of channel to feeder (outside)	\$500 ²³

President James C. Clarke, on September 12, 1871, informed the board that it had been difficult to keep sufficient water in the canal below Seneca for navigation. This problem was due in part to the low stage of the river and in part to the poor condition of Dams Nos. 1 and 2. He described the dams as “very imperfect” structures that should be replaced, although the construction of a new dam at Little Falls should be the highest priority.²⁴

On August 14, 1872, Hutton submitted to the canal board a comprehensive report on the repairs needed to restore the canal to its operating condition. Concerning Dam No. 2, he observed that it

can be kept in condition by the ordinary repair force. A portion near the Virginia shore, where the water is deepest, should be filled in with heavy stones during low water. The channel into the guard lock at this place is obstructed by a submerged rock, which I recommend should be removed.²⁵

President Arthur P. Gorman, on March 10, 1873, reported to the board that the “heavy ice on the Potomac river passed off without very serious damage to any of our permanent Dams on the river.” However, the ice “nearly demolished Dams No. 1 & 2 (Georgetown & Seneca) which are merely dikes of loose stone.” The dams would require extensive repairs to insure “a proper supply of water from Seneca to Georgetown.”²⁶

On June 2, 1873, the board informed the canal company stockholders that the sum of \$3,728.81 had been spent for repairs on Dams Nos. 1, 2, and 3. Concerning the condition of the dams at Little Falls and Seneca Falls, Engineer T. L. Patterson observed:

Dams No. 1 and 2 were originally built of stone thrown together and covered by a rough stone arch laid dry. Owing to some defect in the plan or workmanship, these dams began to fail soon after their completion, and now there is hardly a trace of either left. They have been

²² *Thirty-Eighth Annual Report* (1866), C & O Co., p. 5.

²³ *Proceedings of the President and Board of Directors*, L, 241-45.

²⁴ *Ibid.*, pp. 447-48.

²⁵ *Report of W. R. Hutton, Chief Engineer, As to Condition of Chesapeake and Ohio Canal, With Estimate of Cost of Extraordinary Repairs Required during the Current Year, August 14th, 1872.* (Annapolis, 1872), p. 7.

²⁶ Report of the President to the Directors, February 1873, Ltrs. Recd., C & O Co.

replaced by dykes of stone and brush, which have required an expenditure of large amounts annually to repair the damage from ice and freshets. Both of these dams were broken down throughout by the ice freshets last February since which time a large force has been engaged in their repair, whenever the high water has not prevented it.

It is of the utmost importance that these dykes be replaced by permanent dams of mortared masonry, especially the dam at the “Little Falls.” This dam is required to supply water to the Georgetown level, not only for keeping up the navigation, but to fulfill the contracts made with parties owning water leases, and also, for the supply of the Alexandria, Canal. The quantity required for all these purposes is so large, that it is with the greatest difficulty and expense that the present leaky structure can supply it; and with all this expenditure of money, in times of drought, the quantity that can be introduced into the Canal is insufficient.²⁷

On July 5, 1876, Upton Darley of Seneca wrote a letter to President A. P. Gorman concerning the need to dredge the river channel at Guard Lock No. 2. The channel had slowly been filling with silt and sand, a process that was “a matter of interest to all boatmen who use the river as a means of entrance into the Canal at the Guard Lock.”²⁸

President Gorman, on May 8, 1877, reported to the board of directors that

In addition to the usual repairs, we have been compelled to make large expenditures in restoring Rubble Dams Nos. 1 & 2 which were nearly demolished by the heavy Ice when it passed off the River. The large expenditure on this account can only be avoided by the construction of more permanent structures.²⁹

On November 24, 1877, another great flood swept the Potomac Valley. This one was the worst in 150 years of recorded history of the region. In its wake it left the canal almost a total wreck.³⁰

The board informed the stockholders on June 3, 1878, that the estimated cost of repairs to restore navigation, exclusive of the cost of repairing Dams Nos. 1-4, was \$169,229.88. The entire cost, including repairing the dams, was estimated at between \$225,000 and \$250,000. The repairs to the rubble dams at Little Falls, Seneca Falls, and Harpers Ferry were not expected to exceed \$10,000, but the heavily-damaged Dam No. 4 would virtually have to be rebuilt.³¹

From early August to mid-September 1881, navigation on the canal was partially suspended because of a severe drought. Although some of the most serious problems occurred at Dam No. 6, General Superintendent Stephen Gambrill reported on October 6 that he had experienced “great trouble in keeping up the water from Harpers Ferry to Georgetown.” The entire maintenance crew on that part of the canal had been required to tighten Dams Nos. 1-3.³²

²⁷ *Forty-Fifth Annual Report* (1873), C & O Co., pp. 9, 29.

²⁸ Darley to Gorman, July 5, 1876, Ltrs. Recd., C & O Co.

²⁹ Gorman to Board of Directors, May 8, 1877, Ltrs. Recd., C & O Co. The total expenditure for the repairs on these three dams was \$2,145.19.

³⁰ Sanderlin, *Great National Project*, pp. 241-42.

³¹ *Fiftieth Annual Report* (1878), C & O Co., p. 10.

³² *Proceedings of the President and Board of Directors*, N, 152.

Between May 30 and June 1, 1889, disaster again struck the canal. A titanic flood swept down the Potomac, the crest of which was higher than any ever before recorded in the history of the valley. The damage caused by the rampaging river was fully as impressive as the record heights established by the flood. The damage done and estimated cost of repairs to the Seneca Falls Feeder and Guard Lock No. 2 were as follows:

Coping	\$20
New Bridge	\$40
Repairs to gates and Clearing out Lock	\$200

The flood also left Dam No. 2 in very bad condition. The dam would have to be raised at least eighteen inches, requiring 3,000 perch of stone at a cost of \$1.50 to \$2.00 per perch to repair the structure. Thus, the cost of restoring the dam was estimated at between \$4,500 to \$6,000.³³

The 1889 flood forced the canal company to go into a receivership with the Baltimore and Ohio Railroad emerging as the majority owner of the canal company bonds. Under the railroad, trustees were appointed, and the canal entered its last period of operation. In 1924, after the railroad had captured almost all of its carrying trade, the Chesapeake and Ohio Canal ceased to operate. There is virtually no documentary data dealing with maintenance and reconstruction problems in the C & O Canal Company records for the period 1889-1924. However, secondary sources such as Sanderlin seem to indicate that the canal operated under the railroad much as it had in previous years.

When the Federal Government gained ownership of the canal in September 1938, it promptly set about to restore the waterway as a scenic natural recreation area. Earlier, in February 1937, the Natural Resources Committee had estimated it would cost \$9,000,000 to restore the canal.³⁴ Now, however, the government planned first to reconstruct the twenty-two miles between Georgetown and Dam No. 2 as an experiment. On August 9, 1940, the canal was opened as far as Seneca.³⁵

Today much of Dam No. 2 is reduced to scattered rubble. Despite its poor condition, however, it still impounds a sizeable five-mile-long lake that promotes heavy recreational use of the river.³⁶

³³ Report of Ed Mulvany and S. D. Yound to the Board of Public Works, Washington County, May 13, 1890.

³⁴ *Washington Times*, Feb. 5, 1937.

³⁵ Sanderlin, *Great National Project*, pp. 280-81.

³⁶ See Thomas F. Hahn, *Towpath Guide to the C & O Canal (Section One)* (Washington, 1971), p. 57, for a contemporary description of the Dam No. 2 vicinity.

Appendixes

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Appendix A

Specification for Dams [ca. 1828]

These Dams are to raise the water about four feet above low water mark. They are to be built of stone, after the following manner, viz:

Large and small stones, of any size or shape, are to be thrown indiscriminately into the river, so as to form a segment of a circle, say twenty feet chord to four feet rise, being the structure of the dam when done; these stone, so thrown in, are to form a smaller segment than above, and to receive stone as a cover laid in arch form.

After the rubble stones are shaped to direction in a line across the stream, upon the site to be pointed out by the Engineers of the Chesapeake and Ohio Canal Company, they are to be covered with stone, laid in arch form. These stones are to be about four to twelve inches thick, with good natural parallel beds, and eighteen inches deep in the arch. They shall be laid firmly, and well bedded at the bottom on rock, if it is near the bottom; or, if not, and the Engineer should require it, a rough crib foundation shall be placed at the lower side, so anchored and tied into the stone that the lower timber shall form a firm and solid footing for the lower arch-stone; and in cases where the bottom shall not be sufficiently firm, there shall be, if required, a plank apron, secured under the stone work, and extending eight or ten feet below the lower edge of the arch, to prevent the overfall of water from undermining the dam.

Gravel shall be spread over the dam after done, to fill all interstices, if required, and so as to make it tight.

It is understood that the outer arch of stone shall go on simultaneously with the rubble stone work, so as to secure the work done, unless permission be given to vary the operation.

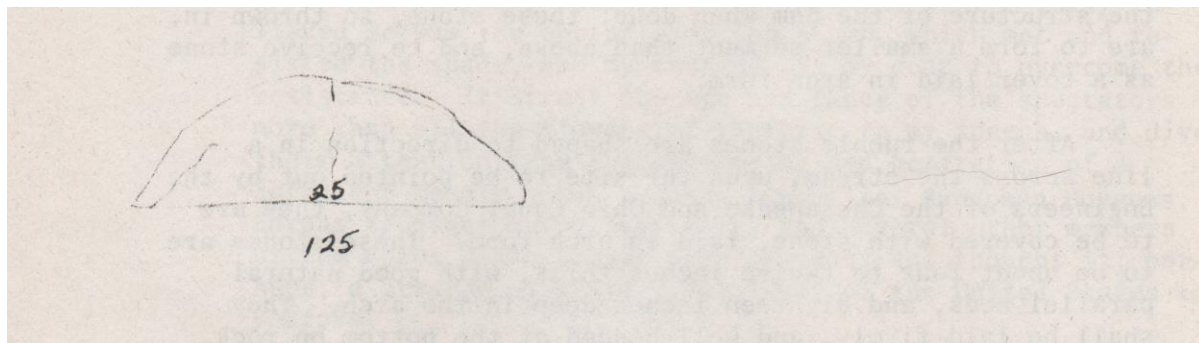
Propose to erect Dam No. , according to the foregoing specification, for the following prices:

10,000 For all stone work, including the outer arch, at per perch of twenty-five cubic feet.

5,000 For such timber as may be required, not less than ten inches diameter, if rough and not hewed, per foot, running measure, prepared and laid.

1,000 For gravel, measured in the boat at the dam, per cubic yard.

[Signed]



The Dams are supposed to be 2000 to 2500 feet in length and will average say 3 to 5 Perch per foot in length. Say 4 perch average perhaps $4\frac{1}{2}$ ought to be calculated as being nearer the truth."

Appendix B

Specification of the Guard Lock & Feeder at Seneca Falls

The Guard Lock is to be built in the regular form of a Lock. Cut stone as required only in the hollow quoins, the rest is to be rubble & hammered work, laid in common lime mortar except the part immediately at the head of the upper Gates which is to be level in cement. The coping to be well joisted & well hammered & three feet wide—the upper surface cut, or scabbled—the height to be equal to a 9 feet lift.

The measurement by the perch of stone laid including everything. It is to be understood that there is neither breastwork nor culverts to this Lock, but four large paddle gates in each Gate. The Gates are to be framed with dovetail tenons, to be wedged into the Posts. T & L's and bolts and nuts are dispensed with. The upper gates may be required to be 3 feet higher than the lower ones. The gate fastenings & cramping, the coping similar to other Locks. — The Lock may be required to be of the same length & width of other Locks. The feeder & Lock pit to be excavated about 180 feet in length, and about 30 feet wide on the water line — The Bank is 250 feet long and is to be arched over in such manner as to permit the water in floods to pass over it without injury.

The excavation will be in part Rock, some of which is to be blasted & especially at the entrance of the feeder, some of which is loose & some solid — The Guard Lock is to be placed near the lower end of the feeder.

The propositions are to be for

Excavation of Earth	per cubic yard
Excavation of Loose Rock	per cubic yard
Excavation of Rock requiring Blasting	per cubic yard
Laying clay into the bank	per cubic yard
Slope wall & arch work to protect the banks and the side of the River - when the Rock is found in the excavation	per cubic yard
Slope wall as above when the stone is brought $\frac{1}{2}$ or $\frac{3}{4}$ of a mile	per cubic yard
Gravel to tighten the slope wall & arch on the bank	per cubic yard

The quantity of each material is estimated as follows:

Of Excavation of Earth	2,523 cubic yds.	including Loose Rock
Of Excavation Solid & Loose Rock	300 cubic yds.	at entrance of feeder
Of Embankment at head of Lock	2,260 cubic yds.	clay to be obtained in the canal below the Guard Lock after it has been excavated from canal
Of paving & arching the Guard bank	1,140 perches	The stone, except what comes out of the excavation, to be brought between $\frac{1}{2}$ & $\frac{3}{4}$ of a mile
Gravelling the Bank	915 perches	Between $\frac{1}{4}$ & $\frac{1}{2}$ mile distance

Paving the River bank 571 perches stone obtained as above
above Lock

The above Estimates were made in conformity to a location of the Guard Lock & feeder at Seneca Falls as made under my inspection, in pursuance of a letter from the Office of the Chesapeake & Ohio Canal Company dated 16th Dec. 1828.

With due respect
Sin. Yours —

John P. Ingle Esqr.
Clerk of Ches. & Ohio
Canal Company

Nathan S. Roberts
Member of the Board of Engineers
Chesapeake & Ohio Canal"

Appendix C

Table of Areas in Square Feet of Segments of a Circle
To the Diameter of 29 ft.—Intended to Calculate the Seneca Dam

Height of the Seg- ment of the Circle on Dam	Paved Part Sq. Ft. Area	Height of bott. of R. above bottom of Canal	Whole Work Sq. Ft. Area	Ht. of Segmt.	Paved Part Sq. Ft. Area	Ht. of R. Bott	Whole Work Sq. Ft. Area
3.0	23.58	3.0	34.67	5.1	34.30	0.9	77.83
3.1	26.17	2.9	36.90	5.2	34.69	0.8	80.19
3.2	24.76	2.8	39.61	5.3	35.09	0.7	82.55
3.3	25.35	2.7	41.79	5.4	35.48	0.6	84.90
3.4	25.94	2.6	42.93	5.5	35.88	0.5	87.26
3.5	26.53	2.5	44.93	5.6	35.28	0.4	89.62
3.6	27.12	2.4	47.25	5.7	36.67	0.3	91.97
3.7	27.71	2.3	49.07	5.8	37.07	0.2	94.33
3.8	28.30	2.2	51.10	5.9	37.46	0.1	96.59
3.9	28.89	2.1	53.13	6.0	37.86	0.0	99.05
4.0	29.48	2.0	55.00	6.1	38.22	-0.1	101.39
4.1	29.92	1.9	57.05	6.2	38.58	-0.2	103.73
4.2	30.36	1.8	59.10	6.3	38.95	-0.3	106.07
4.3	30.80	1.7	61.14	6.4	39.07	-0.4	108.41
4.4	31.24	1.6	62.19	6.5	39.67	-0.5	110.75
4.5	31.68	1.5	65.24	6.6	40.03	-0.6	113.09
4.6	32.12	1.4	67.28	6.7	40.39	-0.7	115.43
4.7	32.55	1.3	69.33	6.8	40.76	-0.8	117.77
4.8	32.99	1.2	71.38	6.9	41.12	-0.9	120.11
4.9	33.43	1.1	73.42	7.0	41.48	-1.0	122.42
5.0	33.90	1.0	75.48				

Appendix D

Instructions Concerning the Construction of the Masonry Locks Leckie to Purcell, July 3, 1829

"To the Engineer & —

Washington July 3, 1829

Sir.

Your attention is particularly requested to the following details respecting the construction of the Locks —

Bottom Timbers and Puddling

The bottom timbers are to be laid solid and level and the spaces between them well filled with puddle that has been cut and treaded until it becomes a solid tenacious mass, that will adhere to the spade when stuck into it, so as to pull up several square feet several inches in endeavoring to extract the spade.

Sheet Pileing and Floors

The sheet pileing under the line of long gates to be let in, or driven at least three feet below the level of the floor; and to be cut off at the level of top of bottom timbers, so that the plank of the lower may be scribed down tight on it, and should be spiked to the side of the timbers, directly under the line of the gate; the plank for the sheet pileing should be 2½ inches thick; each plank being grooved on both edges; and having tongues made that will exactly fit the grooves, set in before driving home the sheet pileing at the upper and lower ends of the lock, to be let in to the same depth, and spiked to the timbers in the same manner, and to raise to the level of the surface of the first floor and to be carefully cut off, so that the plank of the second floor may be shut tight and close down on it, and in every case the sheet pileing should run several feet into the bank to prevent the water from working round the back of the walls; and from the sheet pileing at the head of the lock on the lower floor should extend across the whole line of the head of the lock, and be spiked to the timber that supports the floor in the forebay on the upper level, and continued across into the bank under the towing path and a puddle bed at least three feet thick should raise from the bottom of the first, or lower sheet pileing to the level of the forebay and continue for some distance into the bank on both sides, this precaution will afford additional security in preventing the water from working round, or, under the lock.

Floors of the Locks

The lower floor, on which the masonry is started should be laid closely and carefully so as to exclude the working of the water, and as the plank differs greatly in thickness they should be dubbed off on the under side where they rest on the bottom timbers, so that the upper surface will be a level uniform plane, and that the part under the cut stone facing and culverts should be tongued and grooved to give additional security. As the plank differ in thickness from ¼ to ¾ of

an inch, it is very obvious, if they are laid down without being reduced to a thickness where they rest on the timber, so as to bring the upper surface level, that the upper floor, instead of resting on a smooth uniform surface; will rest on the thickest part of the planks of the lower floor, and there will be considerable longitudinal spaces running the whole length of the lock, where the water may work round between the floors.

Masonry of the Locks

All the cut stone facing should be set with a hoisting machine, because the heavy stone will then be completely under control — the stone should have a lewis let in the upper bed, hoisted, and then let down dry on its bed, when an intelligent and experienced mason will directly see what sort of a bed is wanting to make the stone fit exactly; the stone should then be hoisted about 18 inches and the under bed as well as the place where it is to lay on made wet with a brush and water and the bed put on and the stone carefully laid down on it, and be settled down with a heavy wooden mallet, when, the mortar will come out all around, and the stone lay as solid as it did in the quarry.

When heavy stone are set without being hoisted, they are taken near the place with rollers (and pinch bars, generally used to the great injury of the stone). A bed is then put on at random and two pieces of plank put on, and the stone laid down on the plank, crowbars are then used, and the pieces of plank pulled out, and the stone let down on its bed in the mortar; from this statement it must be very obvious, that stone laid down on this manner must be very imperfectly laid indeed; as there is no previous trial to ascertain what sort of a bed will suit the stone, it is put on by chance, and pulling out the strips of plank would spoil it, even if it had been right at first, and the corners and face of the stone are generally much injured by the crowbars in let it down, and as the beds of the stone are generally cut slack to the square of the face stone "Batters" this is remedied by raising the back part with crowbars, and putting in some chips under the back part of the bed; and then when the stone set on the back part on these chips, and on the front part of the wall and the middle is all hollow, for it must be observed that lifting a heavy stone after being once laid as above described to remedy any defects in the bed is entirely out of the question, without the aid of a hoisting machine.

Filling in the middle of the lock wall with dry stone, and trusting to grouting to make it solid

This mode of masonry is in my opinion very objectionable indeed, and should never be trusted to for several reasons, among whom may be enumerated the necessity of having the grout very liquid that it may penetrate all the vacuities of the dry stone work; in this case it is very certain that when the aqueous or watery part of the grout evaporates, or settles away, that open spaces will be left in the masonry and that, where the surfaces of the stone touch each other, then no grout can get in, and that part of the wall is laid dry.

Grouting in my opinion ought to never to be trusted to, excepting to fill the vertical joints, and the small interstices caused by the irregularities of the materials; every stone should be laid in mortar and struck home to its bed until the mortar come out all around and the stone feels as solid as when it lay in its natural state in the quarry.

The first course of the cut stone in the lock should have the face cut fair and straight for at least six inches from the bottom to permit the upper flooring in the lock and culverts to fit up to it exactly and make it tight joint that will effectually exclude the water.

When the bottom is rock and no wooden floor put in, there are generally many irregularities in the surface, in this case the cut stone should be scribed down close in the irregular surface of the rock in other words the under part of the cut stone should be cut away so as to fit down exactly on the irregularities of the rock, and the upper bed form a straight line, to receive the next course in a regular manner.

I am instructed by the president and Directors to say that they unanimously approve of the preceding modes of executing the masonry &c. of the locks, and to request that you will see them carried into effect by the lock contractors in your intendency.

I am sin.
Signed Rob. Leckie

Appendix E

Contract for Guard Lock and Feeder at Seneca Falls March 14, 1829

Specifications of the Guard Lock & Feeder at Seneca Falls.

The Guard Lock is to be built in the regular form of a Lock. Cut stone as required only in the hollow quoins, the rest is to be rubble & hammered work, laid in common lime mortar except the part immediately at the head of the upper Gates which is to be level in cement. The coping to be well joisted & well hammered & three feet wide—the upper surface cut.

The height to be equal to a 9 feet lift.

The measurement by the perch of stone laid including everything. It is to be understood that there is neither breast work nor culverts to this Lock, but four large paddle gates in each gate.

The Gates are to be framed with dovetail tenons, to be wedged into the Posts. T & L's and bolts and nuts are dispensed with. The upper gates may be required to be 3 feet higher than the lower ones. The gate fastenings & cramping, the coping similar to other locks.

The Lock may be required to be of the same length & width of other Locks. The feeder & Lock pit to be excavated about 180 feet in length, and about 30 feet wide on the water line. The Bank is 250 feet long and is to be arched over in such manner as to permit the water in floods to pass over it without injury.

The excavation will be in part Rock, some of which is to be blasted & especially at the entrance of the feeder, some of which is loose & some solid. The Guard Lock is to be placed near the lower end of the feeder.

The propositions are to be for

Excavation of Earth	per cubic yard
Excavation of Loose Rock	per cubic yard
Excavation of Rock requiring Blasting	per cubic yard
Laying clay into the bank	per cubic yard
Slope wall & arch work to protect the banks and the side of the River - when the Rock is found in the excavation	per cubic yard
Slope wall as above when the stone is brought $\frac{1}{2}$ or $\frac{3}{4}$ of a mile	per cubic yard
Gravel to tighten the slope wall & arch on the bank	per cubic yard

Proposals for constructing the Guard Lock.

Excavating the Lock-pit	at 25 cts per cubic yard
Embanking the Lock	at 12-1/2 cts per cubic yard

For constructing the lock including all materials with Cut
stone hollow quoins and coping at \$4.25 cts per perch

For the Feeder

Excavation of earth	at 18-3/4 cts per cubic yard
Excavation of loose rock	at 25 cts per perch
Rock requiring blasting	at 75 cts per perch
Laying clay into the bank	at 20 cts per cubic yard
Slope wall and arch work to protect the bank	at \$1.20 cts per perch
Gravel to tighten the slope wall and arch on the bank	at 60 cts per cubic yard

March 13th 1829

Signed Holdsworth & Isherwood

Accepted 14th March 1829

Signed John P. Ingle, Clk.

Appendix F

Payments Made by the Company for the Construction of Dam No. 2, Guard Lock No. 2, The Seneca Falls Feeder and the Bridge to Guard Lock No. 2

Dibble, Beaumont and McCord, Contractor

Debit			Credit		
1829			1829		
Aug. 12	To Clemt. Smith , Treas.	\$2,461.72	Aug. 1	To Construc- tion	\$2,735.25
1830			1830		
Mar. 24	To Clemt. Smith, Treas	500.00	May 31	To Construc- tion	690.95
		\$2,961.72			
June 30	To Clemt. Smith, Treas.	464.48			
		\$3,426.20			

Obadiah Gordon, Contractor

1830			1830		
Sept. 13	To Clemt. Smith , Treas.	1,500.00	Oct. 21	To Construc- tion	3,043.27
Oct. 23	To Clemt. Smith , Treas.	1,238.95	Nov. 1	To Construc- tion	1,283.15
Oct. 29	To Clemt. Smith , Treas.	600.00	Dec. 1	To Construc- tion	2,186.95
Nov	To Clemt. Smith , Treas.	554.84			
Dec. 11	To Clemt. Smith , Treas.	1,413.51			
Dec. 22	To Clemt. Smith , Treas.	554.75			
1831			1831		
Apr. 15	To Clemt. Smith , Treas.	30.00	May 5	To Construc- tion	225.00
May 6	To Clemt. Smith , Treas.	202.00	June 16	To Construc- tion	1,898.37
June 17	To Clemt. Smith , Treas.	1,708.54	Sept. 8	To Construc- tion	1,441.37
July 14	To Clemt. Smith , Treas.	24.75	Nov	To Construc- tion	2,13.83
July 29	To Clemt. Smith ,	500.00			

Aug. 26	Treas. To Clemt. Smith ,	150.00		
Sept. 9	Treas. To Clemt. Smith ,	1,400.28		
Nov. 15	Treas. To Clemt. Smith ,	2,313.82		
	Treas.			
		\$12,191.94		\$12,191.94

Elias Gumaer, Contractor

1831			1831		
Jan. 29	To Clemt. Smith ,	\$100.00	May 13	To Construc-	\$1,970.00
	Treas.			tion	
Feb. 5	To Clemt. Smith ,	150.00	Nov	To Construc-	677.60
	Treas.			tion	
Apr. 8	To Clemt. Smith ,	257.72			
	Treas.				
Apr. 29	To Clemt. Smith ,	431.82			
	Treas.				
May 25	To Clemt. Smith ,	849.96			
	Treas.				
July 25	To Clemt. Smith ,	180.00			
	Treas.				
Nov.	To Clemt. Smith ,	678.10			
	Treas.				
		\$2,647.60			\$2,647.60

Thomas F. Purcell, Contractor

1831			1831		
Sept. 30	To Clemt. Smith ,	\$200.00	Dec. 31	To Construc-	\$858.63
	Treas.			tion	
Oct. 21	To Clemt. Smith ,	36.31			
	Treas.				
Nov. 11	To Clemt. Smith ,	300.00			
	Treas.				
Dec. 10	To Clemt. Smith ,	400.00			
	Treas.				
1832			1832		
Jan. 5	To Clemt. Smith ,	22.32	Apr.	To Construc-	100.00
	Treas.			tion	
		\$958.63			\$958.63

Company Hands, Builders

1831

Dec. 31 To Thos. F. Purcell \$858.63

1832June 15 To Clemt. Smith , 919.81
Treas.Oct. 26 To Clemt. Smith , 237.50
Treas.Nov. 3 To Clemt. Smith , 684.88
Treas.Dec. 8 To Clemt. Smith , 315.82
Treas.Dec. 29 To Clemt. Smith , 104.00
Treas.**1833**Jan 12 To Clemt. Smith , 573.09
Treas.

Jan. 17 To J. Y. Young 1,762.76

Feb. 2 To Clemt. Smith , 7.00
Treas.Mar. 16 To Clemt. Smith , 160.00
Treas.

\$5,623.49

June 14 To Clemt. Smith , 100.00
Treas.

Oct. 9 To W. H. Bryan 758.37

Oct. 11 To Clemt. Smith , 95.74
Treas.Nov. To Clemt. Smith , 85.02
Treas.

Dec. 13 To W, H. Bryan 1,082.71

1834Jan. 21 To Clemt. Smith , 11.26
Treas.

\$7,754.59

June 13 To Clemt. Smith , 158.37
Treas.

Sept. 10 To C. B. Fisk 516.84

Sept. 10 To Rob. Barnard, 35.00
TreasNov. 26 To Rob. Barnard, 43.56
Treas.

\$753.77

1831

1832

Apr. 30 To Construc- \$858.63
tion

1833

Ape. To Construc- 4,764.86
tion

\$5,623.49

!834

May 31 To Construc- 1,131.09
tion

\$7,754.58

1835

May 31 To Construc- 753.77
tion

1840

Nov. 30 To J. Y. Young, 878.98
Supt.

1841

Apr. 1 To Construc- 878.98
tion

Guard Lock No. 2 and Feeder

Holdsworth and Isherwood, Contractor

Debit

1829 LOCK FEEDER

July To Clemt. \$447.98
22 Smith, Treas.
Aug. To Clemt. 580.68
7 Smith, Treas.
Dec. To Clemt. 663.85
16 Smith, Treas.

1830

Jan. To Clemt. 522.41 205.09
18 Smith, Treas.
Mar. To Clemt. 41.85
10 Smith, Treas.
May To Clemt. 400.00
5 Smith, Treas.
May To Rich. 1,300.00
12 Holdsworth
\$4,852.09 \$205.09

July To Clemt. 300.00
7 Smith, Treas.
July To Clemt. 704.70
31 Smith, Treas.
July To Clemt. 926.48
31 Smith, Treas.
Oct. To Material 50.50
31
Dec. To Clemt. 600.00
3 Smith, Treas.
\$6,207.29 \$1,431.57

1831

May To Balance to 620.83 159.05

Credit

1829 LOCK FEEDER

July To Con- \$323.75 \$174.00
1 struction
Aug. To Con- 147.44
1 struction
Dec. To Con- 518.76 52.18
1 struction
Dec. To Con- 150.00
1 struction

1830

Jan. To Con- 973.30 1.69
1 struction
Mar. To Con- 46.50
1 struction
May To Con- 2,937.00
1 struction
\$5,096.75 \$227.87
July To Con- 783.00
1 struction
July To Con- 1,362.75
1 struction
July To Con- 948.37
1 struction
\$6,828.12 \$1,590.62
By Balance from
May 31 620.00 159.05
To Con- 9.56
struction
To Rich. 470.83
Holdsworth

31	June 1	
Aug.	To Clemt.	
30	Smith, Treas.	2.56
Jan.	To Clemt.	
4	Smith, Treas.	7.00
June	To Clem.	
3	Smith, Treas.	470.83

1832		LOCK	FEEDER	1832		LOCK	FEEDER
Apr.	To Rich.	620.83	159.05	Oct.	To Con-	197.00	
28	Holdsworth			12	struction		
Sept.	To Clemt.	187.00					
15	Smith, Treas.						
Oct.	To Rich.	197.00					
12	Holdsworth						
Dec.	To Clemt.	31.25					
29	Smith, Treas.						
1833				1833			
Jan.	To Clemt.	43.03		Apr.	To Con-	261.28	
2	Smith, Treas.			20	struction		
		\$458.28				\$458.28	

Bridge to Guard Lock No. 2

Debit			Credit		
1835			1835		
Jan.	To Rob. Barnard,	\$59.82	May	To Con-	\$59.82
	Treas.		31	struction	

Illustrations

Unrau Photographs

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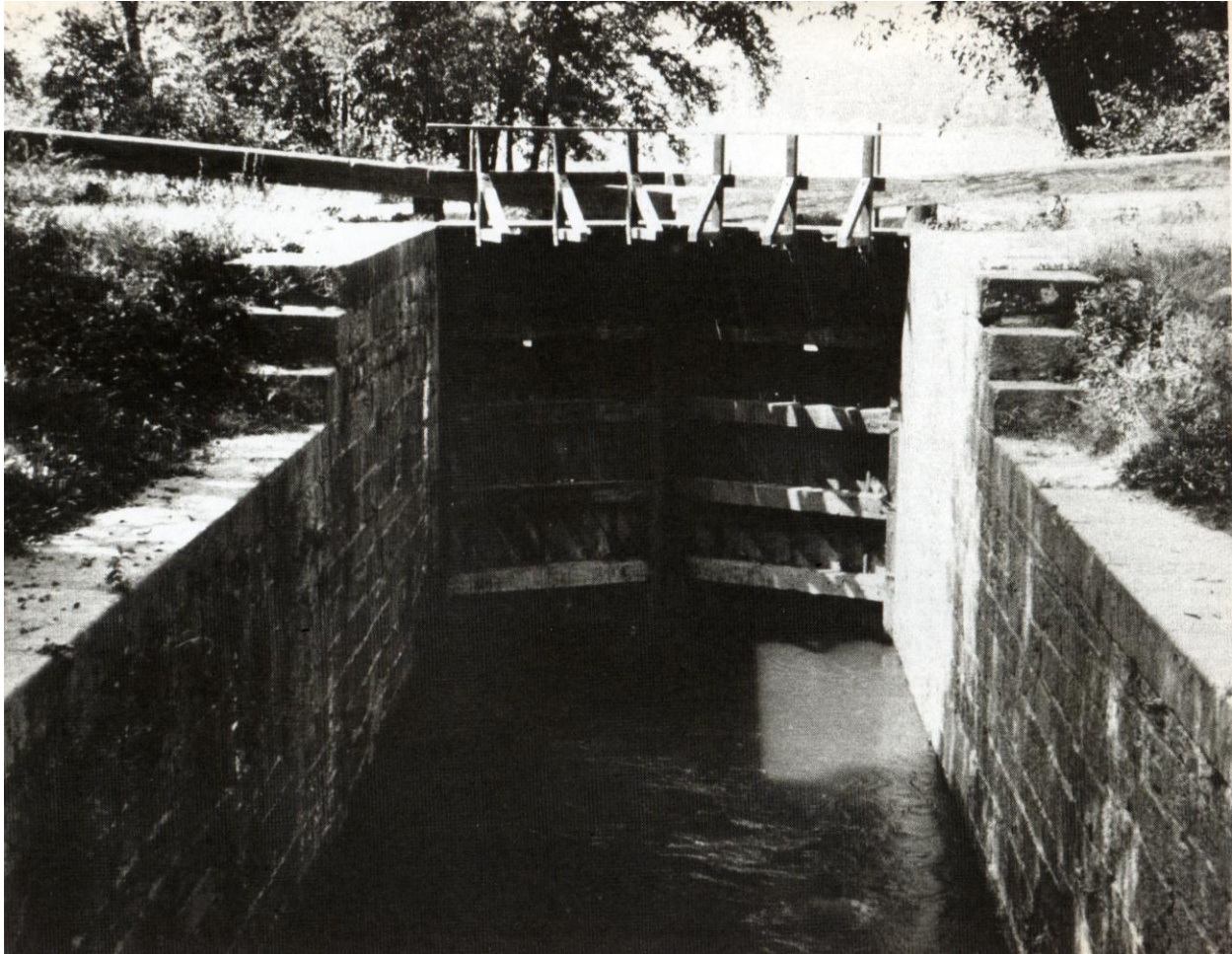
1. Dam No. 2, looking across Potomac River from Maryland side.
Photograph by Harlan D. Unrau, 1974.



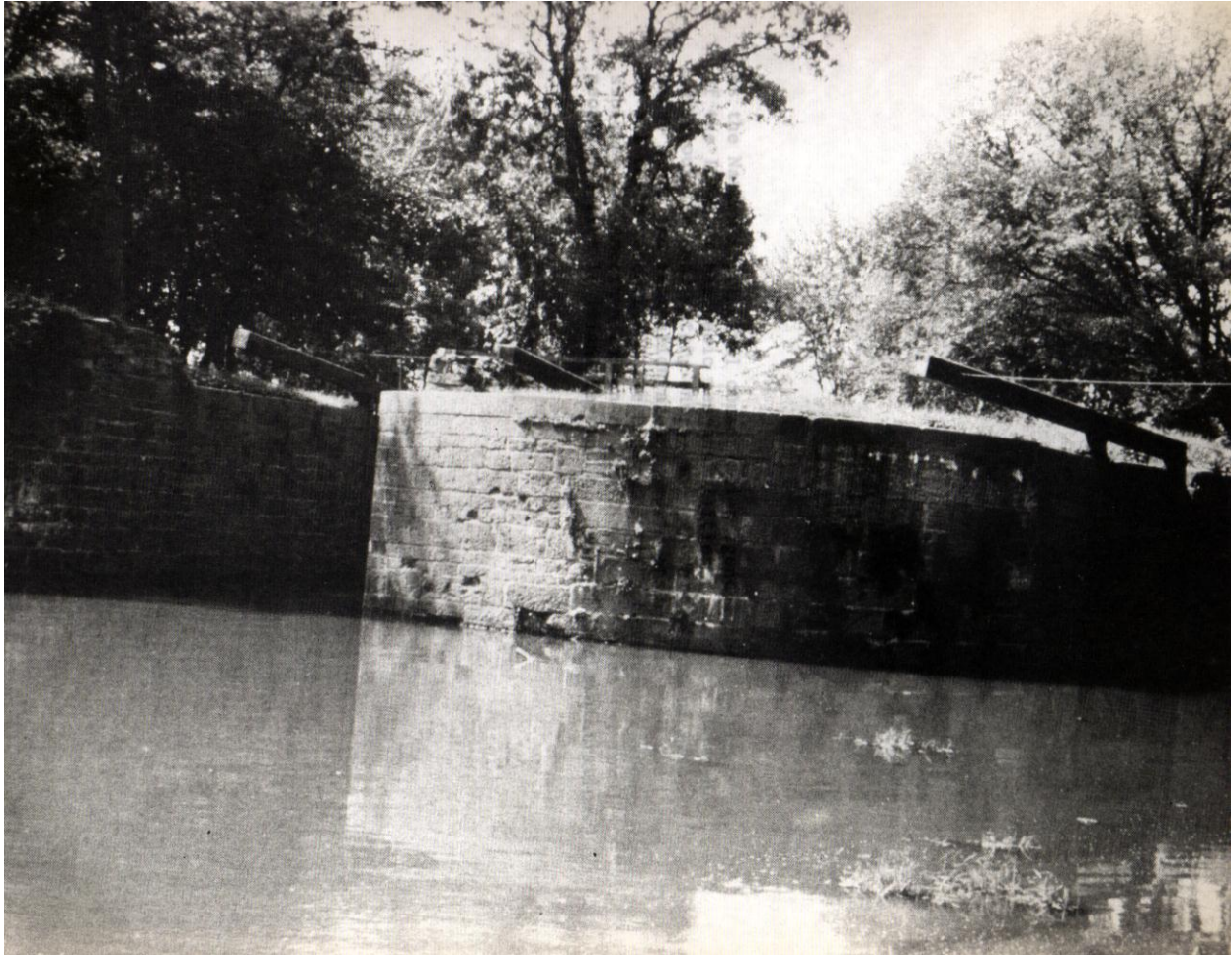
2. Seneca Falls Feeder, looking toward Guard Lock No. 2.
Photograph by Harlan D. Unrau, 1974.



3. West end of Guard Lock No. 2 and Guard Lock Gate.
Photograph by Harlan D. Unrau, 1974.



4. Entrance to Guard Lock No. 2 (left) and Lock No. 23 (right), looking west.
Photograph by Harlan D. Unrau, 1974.



5. "Seneca Dam" [Dam 2] Early 20th Century.

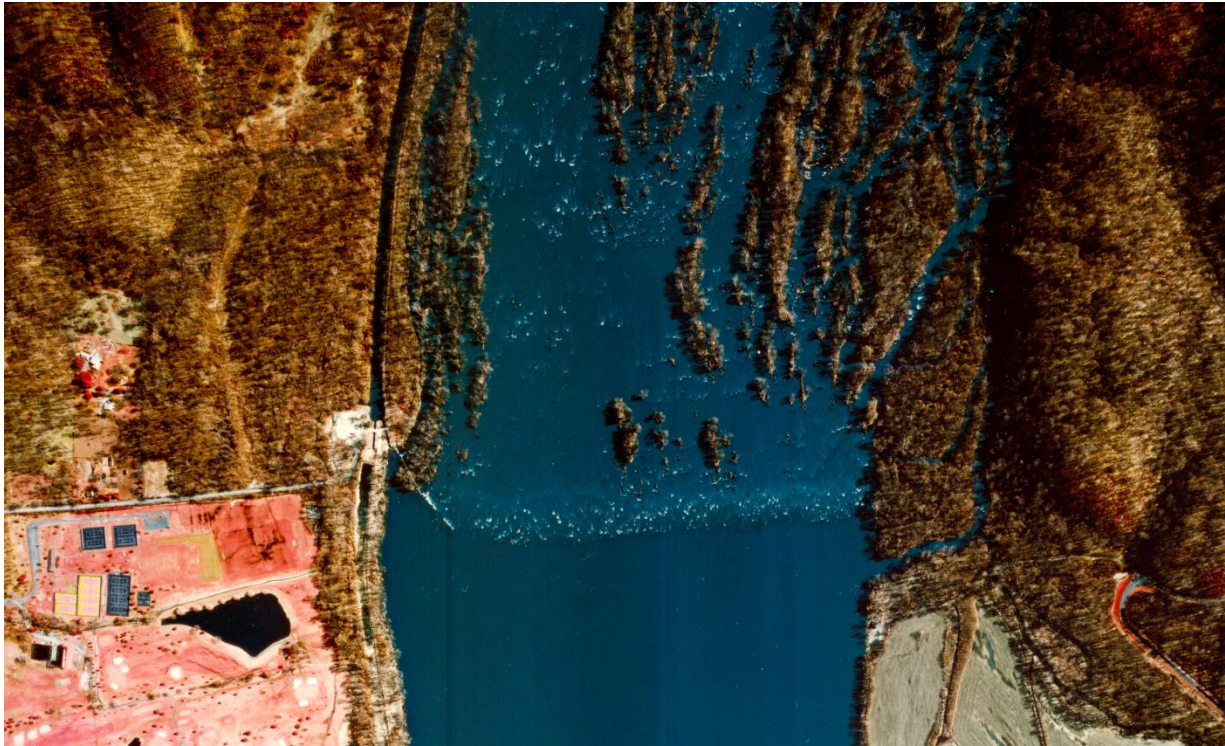
6. Seneca Dam. E. B. Thompson Photograph



7. Seneca Dam. E. B. Thompson Photograph



8. Dam 2, Aerial Photograph



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